

# COVID-19 phobia in a boy with undiagnosed autism spectrum disorder: a case report

**Shoko Sakamoto**

Department of Neuropsychiatry, Osaka City University Graduate School of Medicine

**Dai Miyawaki** (✉ [miyawaki@med.osaka-cu.ac.jp](mailto:miyawaki@med.osaka-cu.ac.jp))

Osaka City University Graduate School of Medicine

**Ayako Goto**

Department of Neuropsychiatry, Osaka City University Graduate School of Medicine

**Yuji Harima**

Department of Neuropsychiatry, Osaka City University Graduate School of Medicine

**Daisuke Tokuhara**

Department of Pediatrics, Osaka City University Graduate School of Medicine

**Koki Inoue**

Department of Neuropsychiatry, Osaka City University Graduate School of Medicine

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## Case report

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# Abstract

## Background

The coronavirus disease (COVID-19) is affecting mental health profoundly. Previous studies have reported pandemic-related anxiety. Anxiety disorder and autism spectrum disorder (ASD) are relatively common comorbidities. However, thus far, there is no report of any patient with undiagnosed ASD who developed anxiety disorders caused by the COVID-19 pandemic.

## Case presentation

In this case report, we describe an 8-year-old Japanese boy with undiagnosed ASD who developed COVID-19 phobia, resulting in avoidant restrictive food intake disorder (ARFID). As COVID-19 was highly publicized in the mass media and the risk of droplet infection was emphasized upon, the patient began to fear viral contamination from food, culminating in a refusal to eat or even swallow his saliva. He was admitted to a pediatric medical center in Osaka with life-threatening dehydration and was then referred to our child psychiatry department for treatment. We clinically diagnosed the patient with COVID-19 phobia resulting in ARFID. We identified the characteristics of ASD from his present social communication skills and developmental history. We provided psychoeducation of ASD for the parents as well as administered supportive psychotherapy for the patient. Shortly after our intervention, which was designed to relieve his ASD-related anxiety, his dysphagia improved. Our findings suggest that children with undiagnosed ASD may develop COVID-19 phobia. In these cases, intervention for ASD, such as sharing information with parents and teachers to explain what autism is and how it is likely to affect the child's development and function, and to make an individual education plan may be more appropriate than starting treatment for anxiety disorders as the first-line option.

## Conclusion

COVID-19 is the biggest pandemic in the recent past and more undiagnosed ASD patients who develop COVID-19 phobia may seek treatment. Clinicians should consider the underlying ASD in these patients and assess their developmental history, such as joint attention, as well as their present social communication skills.

## Background

It is already evident that the psychological effects of the COVID-19 pandemic are pervasive and could affect mental health, by exacerbating anxiety symptoms, now and in the future [1, 2]. At the outbreak of the severe acute respiratory syndrome (SARS) [3] and the H1N1 influenza [4], pandemic illness-related anxiety was reported. Anxiety is common in individuals with autism spectrum disorder (ASD) [5]. However, there has been no report of any patient with undiagnosed ASD who developed anxiety disorders caused by the pandemic. In this case report, we describe COVID-19 phobia resulting in avoidant restrictive food intake disorder (ARFID) in an 8-year-old Japanese boy with undiagnosed ASD. Our treatment

strategy, targeting the ASD characteristics and the overlooked distress related to social communication impairment, improved his dysphagia.

## Case Presentation

The patient was an 8-year-old Japanese boy with no history of eating problems. As COVID-19 was highly publicized in the mass media, he feared its infection so much that he refused to go out anywhere, even to school. He washed his hands and rinsed his mouth excessively. He lost his temper when his family did not take sufficient infection control measures at home, such as wearing a mask or talking low without spitting out. After learning about the risk of its droplet infection, he began to fear viral contamination from food, culminating in a refusal to eat for three weeks. He became unable to even swallow his own saliva. Because of life-threatening dehydration, he was admitted to a pediatric medical center in Osaka following a week of outpatient pediatric treatment with no improvement and was referred to our child psychiatry department for psychiatric treatment.

After admission, he received physical treatment, such as intravenous feeding by pediatricians without any fear of getting infected, in parallel with intervention by a psychiatrist. He kept smiling at the medical staff even when he was in trouble, but did not answer any questions, indicating atypical social communication. To evaluate his developmental history, we comprehensively interviewed the patient and his mother. At the age of 2, he had little interest in other children or joint attention. At the age of 3, he passively attended nursery school, but tended to engage in stereotyped play and hated to be disturbed by others. He wanted to avoid novel situations and rarely asked his teachers or classmates for help despite facing difficulties. He also exhibited hypersensitivity to sound and smell. Nevertheless, his development was assessed as normal in medical checkups at 18 months and 3 years of age because he had no obvious delayed speech. His intelligence and language abilities were normal (Wechsler Intelligence Scale for Children IV: Full Scale IQ = 95). We used the Pervasive Developmental Disorders Autism Society Japan Rating Scale (PARS) [6], a standardized semi-structured interview useful for children and adults, and the Japanese version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children – Present and Lifetime Version (K-SADS-PL) [7] for assessment. He has been exceeding the cutoff score for ASD on PARS since early childhood and to the present. We confirmed that he had persistent deficits in social communication social interaction, and relationships development. He also had restricted and repetitive interests, and hyperreactivity to sensory inputs. Subsequently, we diagnosed ASD based on the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)* criteria. The total clinical evaluation showed that he had COVID-19 phobia, resulting in ARFID. Thus, we suggest that overlooked social difficulties related to undiagnosed ASD serve as a predisposing factor for the development of COVID-19 phobia resulting in ARFID.

The treatment approach that we employed focused on the patient's ASD traits. We told his parents that verbal threat information about COVID-19 (i.e. the number of infected people or deaths) from the media could promote his fear because of his literal interpretation and that blaming him for refusing to eat was not effective. Medical staff ensured the safety of the food and showed him the menu to teach him that

eating had no relation with COVID-19 infection. As his fear faded, his dysphagia improved significantly and he was able to orally consume more than half of his food. We discharged him in two weeks and continued his treatment in our outpatient clinic. We administered supportive psychotherapy to him and educated his parents and teachers about ASD and its supportive methods. The food intake and his body weight returned to pre-onset levels within two months. Currently, the patient has become more adaptive at school through an individual education program and been in complete remission of COVID-19 phobia for six months. Written informed consent and assent were taken from the patient and parents according to the IRB regulation.

## Discussion

To the best of our knowledge, this is the first report of COVID-19 phobia in a child with undiagnosed ASD and provides two important insights. Firstly, children with undiagnosed ASD may develop COVID-19 phobia following the recent pandemic. Secondly, in diagnosed cases, intervention for ASD, such as sharing information with parents and teachers to explain what autism is and how it is likely to affect the child's development and function, and to make an individual education plan may be more appropriate than starting treatment for anxiety disorders as the first-line option.

Children with undiagnosed ASD suffer from social difficulties related to the traits [8] and we suggest that their overlooked distress can be a predisposing factor for the development of anxiety disorders. Children with ASD often show anxiety, which Boulter et al. (2014) pointed out to be associated with intolerance to uncertainty [9]. Children with ASD interpret all ambiguous information as threatening, contributing to significant somatic stress responses in the face of novel or uncertain situations [9]. It is highly possible that children with ASD are more vulnerable to verbal threat information from the media because they interpret it literally, possibly worsening their anxiety. In undiagnosed cases, children do not have any support for their ASD traits and anxiety can exacerbate [8]. The effect of the COVID-19 pandemic on mental health concerns, including anxiety symptoms, has been reported [1], which can continue to increase in such an unprecedented condition. Even during the outbreak of the SARS [3] and the H1N1 influenza [4], pandemic-related anxiety was reported to be associated with high publicity in the mass media.

Many children with ASD remain undiagnosed as early symptoms of ASD can easily be overlooked. Among ASD patients, there are significant differences in phenotypic expressions, associated with high rates of comorbidity with other psychiatric disorders [12]. Psychiatric comorbidities can also obscure an underlying ASD and delay its diagnosis, although in some cases, ASD can be diagnosed before the third birthday. We, therefore, expect that more undiagnosed ASD patients developing anxiety disorders caused by the pandemic may seek treatment.

Our findings suggest that intervention for ASD may be more appropriate than starting treatment for anxiety disorders as the first-line option in children with ASD who developed COVID-19 phobia caused by the pandemic. We simply helped the parents and teachers understand the ASD characteristics such as

literal interpretation and hypersensitivity. We gave visual support and allowed him to play by himself, not in a group, for his personal space. After our treatment, his anxiety was relieved and dysphagia improved. Spain et al. (2015) reported that for individuals with an ASD and an anxiety disorder but no intellectual disability, cognitive behavioral therapy modified by the direct instruction of social skills, increased family involvement, visual supports, individualized reinforcers, embedded perseverative interests in sessions, and reduced emphasis on abstract concepts and visualization have been supported by research [13]. In cases of ASD with Anorexia nervosa (AN), which is a relatively common comorbidity, the presence of underlying ASD traits, such as rigidity and low introspection, effectively maintains AN. Thus, the patients require adapted or targeted treatment programs [14]. A previous study reported that cognitive remediation therapy to address problems with cognitive style and meta-cognition by stimulating the neural connections involved in cognitive processing through cognitive tasks, reflection, and behavioral experiments, was efficient for the treatment of patients with ASD and AN [15]. Their findings support our contention that intervention for ASD may be more appropriate than starting treatment for anxiety disorders as the first-line option in children with ASD who developed COVID-19 phobia caused by the pandemic. Our strength is that we diagnosed ASD based on the *DSM-5* criteria through the standardized semi-structured interview. The therapeutic potential in the treatment of these cases, however, need to be further examined in future studies.

## Conclusion

Children with undiagnosed ASD may develop COVID-19 phobia due to the recent pandemic. Several patients developing ARFID should be considered to have undiagnosed ASD. In these cases, intervention for ASD, such as sharing information with parents and teachers to explain what autism is and how it is likely to affect the child's development and function, and making individual education plans may be more appropriate than starting treatment for anxiety disorders as the first-line option. COVID-19 is the biggest pandemic in the recent past and more undiagnosed ASD patients who develop COVID-19 phobia may seek treatment. Clinicians should consider underlying ASD in the patients and assess their developmental history, such as joint attention, as well as their present social communication skills. Further studies are required to clarify the prevalence of ASD in the patients with COVID-19 phobia and a large controlled study is needed to fully evaluate the effectiveness of our clinical strategies.

## Abbreviations

COVID-19: Coronavirus disease 2019; ASD: Autism spectrum disorder; ARFID: Avoidant restrictive food intake disorder; SARS: Severe acute respiratory syndrome; PARS: Pervasive developmental disorders autism society japan rating scale; SADS-PL: Schedule for affective disorders and schizophrenia for school-age children – present and lifetime version; AN: Anorexia nervosa

## Declarations

**Ethics approval and consent to participate:** The ethics committee of our hospital does not require approval for case reports. Written informed consent to participate was obtained from the parents.

**Consent for publication:** Written informed consent was obtained from the parents for publication of this case report.

**Availability of data and materials:** Not applicable.

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## Authors' information

<sup>1</sup> Department of Neuropsychiatry, <sup>2</sup> Department of Pediatrics, Osaka City University Graduate School of Medicine, Asahi-machi, Abeno-ku, Osaka 5458585, Japan

## References

1. Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *Lancet Psychiatry*. 2020;7:547-60.
2. Shigemura J, Ursano RJ, Morganstein JC, Kurosawa M, Benedek DM. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci*. 2020;74:281-82.
3. Carvalho PMM, Moreira MM, de Oliveira MNA, Landim JMM, Neto MLR. The psychiatric impact of the novel coronavirus outbreak. *Psychiatry Res*. 2020;286:112902.
4. Wheaton MG, Abramowitz JS, Berman NC, Fabricant LE, Olatunji BO. Psychological Predictors of Anxiety in Response to the H1N1 (Swine Flu) Pandemic. *Cognit Ther Res*. 2012;36:210-8.
5. Lang R, Mahoney R, El Zein F, Delaune E, Amidon M. Evidence to practice: treatment of anxiety in individuals with autism spectrum disorders. *Neuropsychiatr Dis Treat*. 2011;7:27-30.
6. Ito H, Tani I, Yukihiro R, Adachi J, Hara K, Ogasawara M. Validation of an interview-based rating scale developed in Japan for pervasive developmental disorders. *Res Autism Spectr Disord*. 2012;6:1265-72.

7. Takahashi K, Miyawaki D, Suzuki F, Mamoto A, Matsushima N, Tsuji H, et al. Hyperactivity and comorbidity in Japanese children with attention-deficit/hyperactivity disorder. *Psychiatry Clin Neurosci*. 2007;61:255-62.
8. Miyawaki D, Iwakura Y, Seto T, Kusaka H, Goto AY, Okada Y, et al. Psychogenic nonepileptic seizures as a manifestation of psychological distress associated with undiagnosed autism spectrum disorder. *Neuropsychiatr Dis Treat*. 2016;12:185-9.
9. Boulter C, Freeston M, South M, Rodgers J. Intolerance of Uncertainty as a Framework for Understanding Anxiety in Children and Adolescents with Autism Spectrum Disorders. *J Autism Dev Disord*. 2014;44:1391-402.
10. Goodwin A, Matthews NL, Smith CJ. Parent-reported early symptoms of autism spectrum disorder in children without intellectual disability who were diagnosed at school age. *Autism*. 2019;23:770-82.
11. Bartolotta T, Rizzolo D. Recognizing autism spectrum disorder. *JAAPA*. 2019;32:22-6.
12. Crucitti M, Muscatello MRA, Bruno A, Pandolfo G, Zoccali RA, Mento C. The hidden faces of autism and misdiagnosis in the lifespan: Clinical observations in adults with Autism Spectrum Disorders. *Life Span Disabil*. 2018;21:31-45.
13. Richards M, Mossey J, Robins DL. Parents' Concerns as They Relate to Their Child's Development and Later Diagnosis of Autism Spectrum Disorder. *J Dev Behav Pediatr*. 2016;37:532-40.
14. Spain D, Sin J, Chalder T, Murphy D, Happe F. Cognitive behaviour therapy for adults with autism spectrum disorders and psychiatric co-morbidity: A review. *Res Autism Spectr Disord*. 2015;9:151-62.
15. Kinnaird E, Norton C, Tchanturia K. Clinicians' views on working with anorexia nervosa and autism spectrum disorder comorbidity: a qualitative study. *Bmc Psychiatry*. 2017;17:292.
16. Dandil Y, Baillie C, Tchanturia K. Cognitive Remediation Therapy as a Feasible Treatment for a Young Person with Anorexia Nervosa and Autism Spectrum Disorder Comorbidity: A Case Study. *Clin Case Stud*. 2020;19:115-32.